Railway applications - Railway rolling stock cables having special fire performance - Thin wall - Part 4: Multicore and multipair cables standard wall sheathed

Railway applications - Railway rolling stock cables having special fire performance - Thin wall - Part 4: Multicore and multipair cables standard wall sheathed

EESTI STANDARDIKESKUS

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 50306-4:2003 sisaldab Euroopa standardi EN 50306-4:2002 ingliskeelset teksti. Käesolev dokument on jõustatud 15.01.2003 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 50306-4:2003 consists of the English text of the European standard EN 50306-4:2002. This document is endorsed on 15.01.2003 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: EN 50306-4 specifies requirements for, and constructions and dimensions of, multicore and multipair cables rated 300 V to earth, of the following types: - unscreened, sheathed for either exposed or protected wiring (0,5 mm 2 to 2,5 mm 2 , number of cores from 2 to 48); - screened, sheathed for either exposed or protected wiring (0,5 mm 2 to 2,5 mm 2 , number of cores from 2 to 8); - screened, sheathed for either exposed or protected wiring (0,5 mm 2 to 1,5 mm 2 , number of pairs of cores from 2 to 7).	**Scope:** EN 50306-4 specifies requirements for, and constructions and dimensions of, multicore and multipair cables rated 300 V to earth, of the following types: - unscreened, sheathed for either exposed or protected wiring (0,5 mm 2 to 2,5 mm 2 , number of cores from 2 to 48); - screened, sheathed for either exposed or protected wiring (0,5 mm 2 to 2,5 mm 2 , number of cores from 2 to 8); - screened, sheathed for either exposed or protected wiring (0,5 mm 2 to 1,5 mm 2 , number of pairs of cores from 2 to 7).

ICS 13.220.40, 45.060.01

Võtmesõnad: electric locomo, electrically-opera, flame propagation, protectors, railroad vehicles, safety requirements, sheaths, shielded, specification (approval), specifications, surface spread of flame, testing, traffic vehicles, wall thicknesses, voltage measurement

EUROPEAN STANDARD **EN 50306-4**

NORME EUROPÉENNE

EUROPÄISCHE NORM October 2002

ICS 13.220.40; 45.060.01

English version

Railway applications - Railway rolling stock cables having special fire performance - Thin wall Part 4: Multicore and multipair cables standard wall sheathed

Applications ferroviaires - Câbles pour matériel roulant ferroviaire ayant des performances particulières de comportement au feu - Isolation mince Partie 4: Câbles multiconducteurs et multipaires avec gaine d'épaisseur normale

Bahnanwendungen - Kabel und Leitungen für Schienenfahrzeuge mit verbessertem Verhalten im Brandfall - Reduzierte Isolierwanddicken Teil 4: Mehradrige und mehrpaarige Leitungen mit Standardmantelwanddicken

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 50306-4:2002 E

Foreword

This European Standard was prepared by Working Group 12, Railway cables, of Technical Committee CENELEC TC 20, Electric cables, as part of the overall programme of work in CENELEC TC 9X, Electrical and electronic applications for railways.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50306-4 on 2002-06-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2003-07-01

- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2008-07-01

Annexes designated “informative” are given for information only.
In this standard, annexes A and B are informative.

Contents

Introduction

EN 50306 covers a range of sheathed and unsheathed cables with thin wall thickness insulation, based on halogen free materials, for use in railway rolling stock. It is divided into four parts:

Part 1: General requirements;
Part 2 : Single core cables;
Part 3: Single core and multicore cables (pairs, triples and quads) screened and thin wall sheathed;
Part 4: Multicore and multipair cables, standard wall sheathed.

Special test methods referred to in EN 50306 are given in EN 50305. A Guide to Use is given in EN 50355 [1)].

EN 50306-1, General requirements, contains a more extensive introduction to EN 50306, and should be read in conjunction with this European Standard.

1 Scope

EN 50306-4 specifies requirements for, and constructions and dimensions of, multicore and multipair cables rated 300 V to earth, of the following types:

- unscreened, sheathed for either exposed or protected wiring (0,5 mm^2 to 2,5 mm^2, number of cores from 2 to 48);
- screened, sheathed for either exposed or protected wiring (0,5 mm^2 to 2,5 mm^2, number of cores from 2 to 8);
- screened, sheathed for either exposed or protected wiring (0,5 mm^2 to 1,5 mm^2, number of pairs of cores from 2 to 7).

NOTE 1 Not all conductor sizes/number of cores are specified for every type.

All cables have stranded tinned copper conductors, halogen-free, thin wall thickness insulation and standard wall thickness sheath. Cable types are specified for use in exposed situations (Class E), and for protected situations (Class P). They are for use in railway rolling stock as fixed wiring, or wiring where limited flexing in operation is encountered. The requirements provide for a continuous operational life at temperatures of 90 °C or 105 °C dependent upon the sheath system type.

NOTE 2 In EN 50306-4 the higher temperature rating of 105 °C is only allowed where sheath type S2 is used, and where it has been specifically tested for the higher rating (i.e. by long-term thermal endurance testing to demonstrate a lifetime of at least 20 000 h at 125 °C).

The maximum temperature for short-circuit conditions of 160 °C is based on a duration of 5 s.

The cables specified in EN 50306-4 which have a sheath of type EM 101, EM 103 or S2 material are suitable for operation at temperatures as low as – 25 °C and those with sheath of type EM 102 or EM 104 material are suitable for operation at temperatures as low as - 40 °C.

NOTE 3 Where fuel oil is present sheath types EM 101 and EM 102 are not suitable.

NOTE 4 S2 material may also be suitable for operational temperatures as low as –40 °C, but if so must be tested accordingly to confirm this.

1) At draft stage.

Under fire conditions the cables exhibit special performance characteristics in respect of maximum permissible flame propagation (flame spread) and maximum permissible emission of smoke and toxic gases. These requirements are specified to permit the cables to satisfy Hazard Levels 2, 3 or 4 of EN 45545-1 [2)].

NOTE 5 Requirements for the emission of smoke and gases are not specified for cables used for Hazard Level 1 of EN 45545-1.

NOTE 6 EN 45545-1 is still under development and should be consulted.

EN 50306-4 should be used in conjunction with EN 50306-1, General requirements, EN 50306-2, Single core cables, and EN 50306-3, Single core and multicore cables.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 45545-1 [2)]	Railway applications - Fire protection of railway vehicles Part 1: General
EN 50265-2-1	Common test methods for cables under fire conditions - Test for resistance to vertical flame propagation for a single insulated conductor or cable - Part 2-1: Procedures - 1 kW pre-mixed flame
EN 50267-2-1	Common test methods for cables under fire conditions - Tests on gases evolved during combustion of materials from cables Part 2-1: Procedures - Determination of the amount of halogen acid gas
EN 50267-2-2	Common test methods for cables under fire conditions - Tests on gases evolved during combustion of materials from cables Part 2-2: Procedures - Determination of degree of acidity of gases for materials by measuring pH and conductivity
EN 50268-2	Common test methods for cables under fire conditions - Measurement of smoke density of cables burning under defined conditions Part 2: Procedure
EN 50305	Railway applications - Railway rolling stock cables having special fire performance - Test methods
EN 50306-1	Railway applications-Railway rolling stock cables having special fire performance - Thin wall - Part 1: General requirements
EN 50306-2	Railway applications-Railway rolling stock cables having special fire performance - Thin wall - Part 2: Single core cables
EN 60684-2	Flexible insulating sleeving - Part 2: Methods of test
EN 60811-1-1	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 1-1: General application - Measurement of thickness and overall dimensions - Tests for determining the mechanical properties (IEC 60811-1-1)

2) At draft stage.

EN 60811-1-3 Insulating and sheathing materials of electric and optical cables - Common test methods - Part 1-3: General application - Methods for determining the density - Water absorption tests - Shrinkage test (IEC 60811-1-3)

EN 60811-1-4 Insulating and sheathing materials of electric and optical cables - Common test methods - Part 1-4: General application - Test at low temperature (IEC 60811-1-4)

EN 60811-2-1 Insulating and sheathing materials of electric and optical cables - Common test methods - Part 2-1: Methods specific to elastomeric compounds - Ozone resistance, hot set and mineral oil immersion tests (IEC 60811-2-1)

3 Multicore cables - sheathed

3.1 General

The completed cables shall conform to the applicable general requirements given in EN 50306-1 and to the specific requirements of clause 3 and clause 4.

Conformity with the requirements shall be checked by inspection and by the tests given in Table 2.

3.2 Designation, marking and coding

3.2.1 Code designation

For the purpose of supplying cables to this clause of the standard, the following code designation shall be used:

- EN reference;
- table number;
- cable class (P or E);
- number of cores and conductor size;
- identifier for the particular Hazard Level (see 3.2.2);
- temperature rating.

For example:

EN 50306-4 1P 4x2,5 CC 90

3.2.2 Code identities for cables suitable for use in particular hazard levels

The following letters shall be used as a code to identify the suitability of a particular cable for use under one of the Hazard Levels of EN 45545-1, and to indicate performance levels relating to low temperature and to oil and fuel resistance:

NOTE For sheathed cables two letters are required, one for the insulation and one for the sheath.